VOL. 23 APRIL 1, 1937 NO. 14

Arbor Day Number

Tree Days in Our Schools

JOSEPH S. ILLICK, PROFESSOR OF FOREST MANAGEMENT, NEW YORK STATE COLLEGE OF FORESTRY, SYRACUSE

Arbor Day means Tree Day. It is a special day set apart to consider our trees and forests.

This important day has been observed by our schools and other organizations for more than 60 years. It was first observed in Nebraska in 1872, under the forward-looking leadership of Governor J. Sterling Morton, who was born at Adams, N. Y., on April 22, 1832. He spent his early boyhood in Jefferson county in this State amid the great hardwood and pine forests of the North Country. After being graduated from Union College in 1854 he settled in Nebraska, where the treeless prairies stood in strong contrast with the almost unbroken forests of his boyhood days in northwestern New York. During his boyhood lumbering was rapidly becoming a great industry in the Empire State, and in 1850 when he was entering college, New York led all other states in lumber production. Under such conditions it could hardly have been otherwise than that he should appreciate the needs for and the benefits of trees and forests in his new home environment of treeless Nebraska. It is to his everlasting credit that he conceived the need for a special tree day, and then designated it officially as Arbor Day in 1872, when governor of his adopted state.

Arbor Day is now an annual celebration in the schools of most states. In some states two days are designated as Arbor Days, one in spring and the other in the autumn, and in a few states, especially those with a wide range of climatic conditions, as many as three Arbor Days are proclaimed, two in the spring and the other in the autumn. Few special days have maintained so prominent and so enduring a place in our school programs as has Arbor Day, and none is more deserving of the sustained support of our teachers and pupils, for the importance of trees and forests in our everyday life is becoming clearer and clearer as we move forward into the future. Now, more than ever before, it is the duty of all good citizens to think about our trees and forests in an earnest and practical way, and to realize that apart from their economic value, they make for better manhood and womanhood by inspiring better thoughts and cleaner ideas of life. The spiritual value of knowing and admiring trees and being with them is beyond measure.

The story of man's progress would be difficult to tell without frequent reference to his relationship with trees and their many products, uses and services. In all ages and in every land man has lived in close association with trees. In fashioning our own thoughts about trees, it may be helpful to consider the thoughts of others who have expressed themselves on this important subject. A few messages concerning trees from great men are quoted below for the earnest consideration of teachers, pupils and citizens.

Saint Bernard wrote: "Trees and rocks will teach what thou can'st not learn from a master."

Just four months before his death, James Russell Lowell expressed his attitude toward trees in the following inspiring message in a letter written to the school children of our country:

> I sympathize warmly with the gracious object for the furtherance of which Arbor Day was instituted. I have planted many trees and every summer they repay me with an abundant gratitude. There is not a leaf on them but whispers benediction. In my boyhood I put a nut into the earth from which sprang a horse chestnut tree, whose trunk now has a girth of eight feet and sustains a vast dome of verdure, the haunt of birds and bees, and with thoughts as cheery as they. In planting a tree we lay the foundation of a structure of which the seasons shall be the builders and which shall be a joy to others when we are gone.

Ralph Waldo Emerson in writing of Henry David Thoreau said:

"He is the only man I ever saw who realized that God is in every burning bush of autumn, and who senses His kinship to the trees, and who knows that the same Divine life that plays through man, manifests itself in the tree, thus forming a common brotherhood." In a letter to Thomas Carlyle, Emerson told of his discovery, and Carlyle in turn wrote back from his soundproof room in smoky London: "The strange man of whom you tell, who knows his sacred relationship to the trees, wins my devout obeisance, and almost tempts me to cross the stormy Atlantic to grasp his hand and look into his honest eyes."

White Oak

Henry Ward Beecher wrote: "Under this oak I love to sit and hear all the things which its leaves have to tell. No printed leaves have more treasures in history or in literature to those who know how to listen."

Henry Van Dyke knew trees intimately. Late in his life he wrote: "Trees come close to our lives. They are often rooted in our richest feelings and our sweetest memories." At another time he wrote: "He that planteth a tree is a servant of God. He provideth a kindness for many generations and faces that he hath not seen shall bless him."

It was Stephen Girard who said: "If I knew I would die tomorrow I would plant a tree today."

Glenn Frank recently wrote: "The man who plants a tree becomes a partner with God in a creative act, for we can not build trees. We can only preside at the mystery of their growth."

We all know that Theodore Roosevelt was an outdoor man. He knew the trees, the forests, the mountains and the plains, and he knew what they meant to the American people. Here is one of his best tree thoughts: "A people without children would face a hopeless future, a country without trees is almost as hopeless." He also told us that "The conservation of our natural resources (this includes trees and forests) and their proper use constitutes the fundamental problem which underlies almost every other problem of our national life."

That trees are close to the lives of every boy and girl is becoming more and more obvious to all who think seriously about our general welfare. This is as true for the city boy and girl as for those who live in the country. No boy or girl can serve his community, state or nation well who does not appreciate the services of trees and understand their relations to everyday life.

Next to the grasses, trees are the most common type of vegetation on the earth's surface.

Recent forest surveys show that there are approximately 860 different species of forest trees native to the United States. Some botanists claim that there are more than 1000 tree species in this country, but it is probable that they include a considerable number of woody plants that should be classified as shrubs. Some of these native trees were identified and described in the early part of our Nation's history, but many were not found and described until within the past 50 or 75 years. The famous botanist Michaux in his North American Sylva published in 1819 wrote: "The species of large trees are much more numerous in the United States than in Europe; in the United States there are more than 140 species that exceed 30 feet in height, all of which I have examined and described; in France there are but 30 that attain this size, of which 18 enter into the composition of the forests, and 7 only are employed in building." From these records it is very obvious that forest trees are far more numerous in the United States than in Europe, and also that less than one-fourth of our native forest trees were known and described 100 years ago. Great progress has been made during the past 50 years in bringing together valuable information about our native forest trees in all parts of the United States.

In New York state alone there are more than 100 species of native forest trees. Some foresters place the number between 110 and 125. This larger number of native tree species is common for similar regions throughout the eastern United States. It is noteworthy that there are only six important tree species native to New York that are not native to Pennsylvania. On almost any acre of typical mixed hardwood and evergreen forest in New York State it is not unusual to find from 10 to 25 different tree species, and it is a common experience to find from 30 to 40 on an afternoon stroll through a typical forest area in almost any part of the State.

The composition of the forests of the United States stands in strong contrast with that of Europe. Instead of many different kinds of trees as one finds in our forests, those of Europe have relatively few species. In a journey through the forests of Sweden some years ago a Swedish forester informed me that there are three important forest trees native to Sweden, namely spruce, pine and birch. In the vast forests that cover most of Norway, Sweden, Finland and northern Russia there are only about a half dozen native trees of commercial importance. It is of special significance to know that the world-famous forestry programs and practices of central Europe have been developed around not more than 25 different native forest trees.

Just as the forests of central Europe are low in native tree species, so the forests of the tropics are exceptionally high in arborescent vegetation. The forests of Brazil have some 2500 different kinds of trees out of possibly 10,000 woody plants, including shrubs and vines. In the Philippines, with a land area somewhat less than the New England states and New York combined, there are now known between 2500 and 3000 different species of native woody plants, and a recent report places the number of woody plants in the Malay Archipelago at approximately 12,000 species. That there is an astonishing variation in the distribution of the native tree growth throughout the world is becoming more and more apparent as the study of forestry progresses.

The oldest living thing in the world is a big cypress tree growing within a fenced inclosure in the village of Santa Maria del Tule in Oaxaca, Mexico. Its age has been estimated from 3000 to 5000 years. Most authorities are of the opinion that it approaches closely to 5000 years. At five feet above the ground, and by following the depressions in the bark, it has a circumference of 108 feet. Its circumference is, however, out of all common proportions to its height, for it is only 141 feet in height. This is less than the height of many mature trees in the forests of New York State. Each year thousands of travelers visit this unusual tree, which through the centuries has acquired a considerable number of names, some of which are "Montezuma Cypress," "The Big Tree of Tule," "The Old Tree at Oaxaca," and "The Big Vegetable."

The oldest and largest living thing in the United States is the General Sherman Tree in the Sequoia National Park in California. It is one of two species of widely known sequoias of the west coast of the United States. This tree was first discovered by a hunter on August 7, 1879. Its exact age is not known, but the best available estimates made by competent botanists and foresters place its age between

3000 and 4000 years. The dimensions of this unusual tree are:

	Feet
Height above mean base	272.4
Circumference at base	101.6
Greatest base diameter	36.5
Mean base diameter	32.7
Diameter 60 feet above ground..	17.5
Diameter 120 feet above ground	17.0
Height to largest branch.....	130.0
Diameter of largest branch.....	6.8

The estimated volume of the trunk of the General Sherman Tree, exclusive of branches, is 600,120 board feet.

The tallest known living redwood tree (one of the two species of sequoia) is still growing on North Dyerville Flat in the Humboldt Redwood Park in California. Its carefully measured height is 364 feet and its diameter four and one-half feet above the ground is 12 feet and 7 inches. This redwood tree is the tallest known tree in the world.

These old, large and tall trees are truly marvels of the plant kingdom. They drive our imagination to the utmost, especially when it is remembered that these living trees began their life in the distant ages of the past, perhaps when the Pharaohs were building the pyramids and when civilization was only in its formative period. Our old trees, our young trees, in fact, all our trees offer endless opportunity for interesting studies and reports. Our school boys and girls will help do their part as good citizens by considering earnestly and thoughtfully the trees of the forest. Arbor Day is an appropriate time to do this, and some boys and girls may want to continue this good work throughout the year.

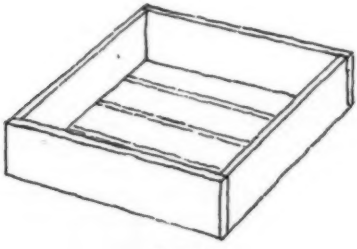
How To Start a Garden

MRS JULIA H. CUMMINS, UTICA

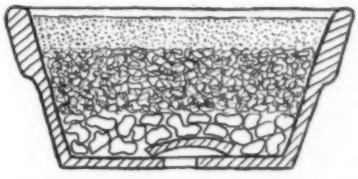
Most persons would like to have a bed of bright-colored flowers which could be picked all through the summer, but they often think it would be hard to make such a garden or hestitate because they do not know how to go about it.

As a matter of fact, this is the easiest sort of garden to plant and take care of because it can be filled with annual flowers which are easy to grow from seed. Annuals do not demand so much in the way of soil preparation and fertilizers as do the plants which live from year to year and are called perennials. It is true that annuals have to be started from seed every year, but then they do not have to be protected through the winter, and are simply pulled up and thrown away after the hard frosts in the fall.

From the first to the middle of April is a good time for sowing the seeds of annuals, which need an early start in order to give a long season of bloom. Boys and girls who want the fun of growing their own plants from seed can start them in a sunny window in the house. They will need some shallow boxes, called flats, not more than three or four inches deep, with holes or cracks in the bottom to let the excess moisture drain out, or some shallow flower pots called bulb-pans. Wooden orange boxes cut down will do nicely. In the bottom put a layer of rough coal ashes



A Flat



Section of Flower Pot Properly Filled with Soil

Photograph by Bachrach

"What More Pleasant Than To Stroll between Flowers!"
Hardy borders on each side of a path.

an inch thick; this is for drainage. Then fill the box or pot to within an inch of the top with soil. If possible this should be taken from the vegetable garden, or from any ground which has been under cultivation. But if this is not available the top layer of dirt from any source may be used, for seeds do not require a rich diet. If the soil is partly frozen or very wet it should be kept in the house until it dries out enough so that when it is squeezed in the hand it crumbles and does not make a mud ball.

It will be best to put the topmost layer of soil through a sieve so that it will be soft and fine, for if seedlings strike their roots down into big cracks or hard lumps they may shrivel up and die. An old wire window screen may be used for this purpose. Then the soil should be pressed down with a piece of flat wood or a brick so that it is level in the box. It is then ready for sowing the seeds.

The seeds should be sown in straight lines about two inches apart in the boxes, or thinly scattered over the surface in the pots, and should be just covered with soil. If they are planted too deep they may get discouraged and never come up. Mark the name of each kind of seed so that it will not be forgotten. Then water the soil with a fine spray so as not to wash the seeds out of the dirt, set the boxes or pots in a sunny window and cover them with a folded newspaper. It may seem queer to set the boxes in the light and then to cover them with paper, but the reason for this is that the paper will help to hold the moisture in the soil, and that most seeds germinate best in the dark even though they need the heat of the sun. As soon as the seeds begin to sprout, the paper should be taken off. The soil should be kept watered sufficiently so that it feels damp and cool to the touch but not water-logged, and should never be allowed to dry out.

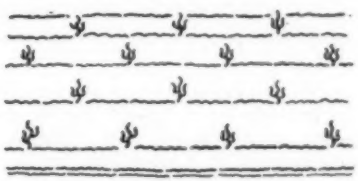
Garage Forming Background of Garden

Among the annuals which make a gay garden there are many which are all the better for an early start in the house. Among them are the different kinds of zinnias, large and small, all brilliant in color and fine for picking. Marigolds of all sorts will grow well if sown out of doors in May, but they will bloom earlier if started in the house. Floss flower (Ageratum) is rather tender and should be started in the house; it is a lovely soft blue and a great bloomer. Then there are the annual larkspurs in many colors, calendulas, annual pinks, pin-cushion flowers (Scabiosa), snapdragons (Antirrhinum), and the various asters which are not so easy for the beginner to grow as are some of the other flowers.

If the seedlings come up very thickly they should be thinned out so as to give each one room to grow. The boxes or pots should be kept watered and weeded until settled weather comes, usually the first week in June, and then the young plants can be transplanted into the bed where they are to grow. It is wise to get them used to the outer air by leaving the boxes outside for a day or so before transplanting.

It is a great help to the little plants if they can be transplanted to their permanent places on a cloudy day or just after a rain, for then they will not suffer from hot sun and will continue growing. If this is not possible it is best to water each plant and to shade it with a strawberry basket, or something of the sort, during the sunny part of each day until it recovers from the move.

It is always a temptation to set the plants near together because they look so small, but most annuals need to be one foot apart as they will fill that space when full-grown. They should be planted in "staggered" rows, that is, each plant in the second row should stand between the two in the first.



Planting in "Staggered" Rows

Three things are necessary after the seedlings have been set out: One is to water them in the morning or evening during very hot weather, another is to give them a little fertilizer as they are coming into bloom and once or twice during their flowering, and the third is to pull out all weeds and to stir the surface of the ground around them as one does so. Annuals should be picked, for if they are allowed to go to seed they will stop blooming.

If time slips by and it gets to be too late to start flowers in the house there is no reason to feel that one can not have a garden, for there are many seeds which can be sown out of doors where they are to grow, including most of those which I have mentioned. Usually the middle

(Concluded on page 139)

The University of the State of New York

Bulletin to the Schools

Issued semimonthly during the school year by the State Education Department

CHARLES F. PROBES, *Editor*

This bulletin is sent without charge to all schools and educational institutions of the State. To others it will be mailed postpaid for 50 cents a year, 5 cents for single copies.

Entered as second-class matter September 30, 1914, at the post office at Albany, N. Y., under the act of August 24, 1912. Acceptance for mailing at special rate of postage provided for in section 1103, act of October 3, 1917, authorized July 19, 1918.

APRIL 1, 1937

Arbor Day Proclamation

The laws of New York require the Commissioner of Education to fix the time for the observance of Arbor Day. This responsibility is undertaken with great pleasure each spring, and for the current year April 23d, April 30th and May 7th are herewith designated. Local school authorities should decide which date will best serve their community, and upon it conduct such programs as may be agreeable and fitting.

Just 65 years ago, a native of our own State, J. Sterling Morton, afterward United States Secretary of Agriculture, first proposed the establishment of an "Arbor Day," to be devoted every year to the planting of trees. This day was at first observed in a voluntary way, but before long most states of the Union adopted it.

It early became the occasion of an annual celebration in the public schools of America. While the immediate effects of such a custom were sentimental, rather than economic, the development of right emotions and habits in millions of school children has eventually caused forests and woodlands to be created throughout the land, and has aroused a determination to conserve our natural resources.

Nor are the spiritual values fostered by Arbor Day to be forgotten. Through the interest and joy we have gained in beautifying our lawns, estates and parks with graceful shade trees and ornamental shrubs, an artistic and esthetic element has been brought into our lives, making them deeper and richer. Our poets have often expressed for us the symbolic meaning of nature and especially of trees.

> O ye glorious creatures, heirs with us of earth!
> Might we win the secret of our loftier birth, —
> From our depths of being grow like you, and climb
> To our heights of blessing, — life would be sublime!
>
> (Lucy Larcom)

Commissioner of Education

Allegany School Offers Natural History Courses

The Allegany School of Natural History will conduct its eleventh session beginning July 4th and continuing through August 21st. This "School in the Forest" is located in the Allegany State Park south of Salamanca and is conducted by the Buffalo Society of Natural Sciences in cooperation with the New York State Museum and the Allegany State Park Commission. The school is affiliated with the University of Buffalo, which gives college credits for courses taken at the school.

Courses in field zoology, entomology, botany, nature study and birds are offered by instructors experienced in field and laboratory work. These courses are designed for teachers, college students, camp leaders and naturalists. There is also opportunity for independent and supervised research work.

Dr Robert B. Gordon, of Ohio State University, is director of the school and instructor in botany. The other members of the faculty are: Dr Albert R. Shadle, of the University of Buffalo, instructor in zoology and entomology; Aretas A. Saunders, of Central High School, Bridgeport, Conn., instructor in natural history of birds; and William P. Alexander, Hayes professor of science, Buffalo Society of Natural Sciences, instructor in nature study.

Information about the Allegany School of Natural History may be obtained from Esther W. Eno, registrar, by addressing her at the Buffalo Society of Natural Sciences, Buffalo, N. Y.

(*Concluded from page 137*)

of May is a good time for planting the seeds of annuals outside, and there are some which should always be sown out of doors because they are difficult to transplant. Among these are nasturtiums, annual poppies, portulaca, cornflowers, mignonette, sweet alyssum and candytuft.

Whether the seeds are started in the house or outdoors the preparation for their permanent bed is the same. The soil should be dug at least a foot deep and made fine and soft, with no big stones, roots or weeds. Then some fertilizer should be added; old rotted manure is the best, but if this can not be obtained dried sheep manure may be used, or some commercial fertilizer. Wood ashes from the fireplace or stove are helpful if raked into the surface of the bed.

All this is more fun than it sounds, and the results are best of all. Big bunches of flowers to bring into the house and to give to one's friends are worth all the trouble, and besides what seems like trouble turns out to be a most absorbing pastime.

When the beginner has learned how to grow annuals and has gained some confidence in himself as a gardener he can turn his mind on how to plan a garden for artistic effect. There are, for instance, borders of hardy flowers laid out on each side of a path — for what can be more pleasant than to stroll between flowers? Or the end of a garage may be utilized as the background of a garden, with a little wall fountain dripping into a pool beneath, instead of the usual ugly object which has to be screened from sight. The simplest plan is often the most effective, and an open bit of lawn with flower borders around it affords a pleasant view and a delightful place to sit. The garden which is used and enjoyed is the nicest garden of all.

Helping the Amateur Naturalist

A. T. SHOREY, CAMP SITE INSPECTOR, NEW YORK STATE CONSERVATION DEPARTMENT

Change is the order of the universe and the cause of much debate between the oncoming and outgoing generations of mankind. In the lifetime of a man who reached mature years 30 years ago the great effort was to consume and destroy natural resources. Then came Theodore Roosevelt of New York State to make the Nation conservation minded. The old timer saw forests change to stump-strewn wastes or into farms. The present generation sees the run-down farms and stubble fields change into forest plantations, and the youth of today will see these plantations grow into mature forests. The cause of conservation, both in New York State and in the Nation, owes much to the first Roosevelt and to the present Roosevelt, both of whom were chief magistrates of this State and Nation.

In the old days wild life existed to be destroyed. In this State thousands of noble trees were destroyed only for their bark; thousands of deer were slain annually only for the hides; ponds and lakes were dynamited for fish. Today in New York the tree is ennobled. It is "The Sacred Tree," the friend of man and the preventer of floods and erosion. On millions of acres it is a criminal offense to cut a tree. Wise laws protect and perpetuate the once fast-disappearing deer and fish. This is conservation.

In the old days comparatively few persons were interested in forest recreation or in the wild life or flora of the forest. Today millions of people turn to the forests to gain health and vigor; for pleasure, and to improve their cultural outlook. Last season over half a million persons registered for a period of from one day to four weeks at the 27 public camp sites maintained by the Conservation Department in the wild regions of the Adirondacks and Catskills.

Without realizing it perhaps, these people get close to the wild life of the forest and are influenced by it. They become inquisitive. This curiosity is encouraged by the schools, by the 4-H clubs, by the Scout organizations. It is now being encouraged by the Conservation Department.

Of the thousands of persons from the cities who spend their vacations in the public camp sites in the Adirondack and Catskill Forest Preserve, it was observed that comparatively few knew the names of the different species of trees, birds, wild flowers, ferns and mosses. It was evident that many campers would be interested to know about these things. So, through the cooperation of the New York State College of Forestry, a camp naturalist was installed at the largest of the Forest Preserve

Photograph by Jewell, Rome

Pixley Falls Public Camp Site, in Boonville Gorge

public camp sites, located at Fish Creek pond near Upper Saranac.

For the past two seasons Marvin Wilson, of Syracuse University, had the interesting job of introducing campers from the city to the natural history marvels of the region. At the beginning of the season he starts to assemble a camp museum, encourages the campers to search for and bring in specimens, conducts an information service on the flora and fauna of the region, conducts evening campfire talks, sometimes with moving pictures, conducts nature hikes and in general acts as liaison officer between the campers and the animate and inanimate denizens of the forest. By the close of the season the museum has accumulated much material, all local, and this has had its effect on the cultural life of many persons. It is hoped to extend this service to the Wilmington Notch and Meacham Lake camp sites this coming summer.

In arousing the curiosity of city people about the forest, one task was to get them unconsciously to observe little things. It is astonishing how few persons know how to observe details. The eyes of the Indian, of the pioneer, of the woodsman were keen, observant, analytical. They saw objects, big and little, not in mass but in component parts. Life or death often depended on observing the signs of the forest in detail and in interpreting their meaning. Many of us moderns have lost the observing eye and do not really see what we look at.

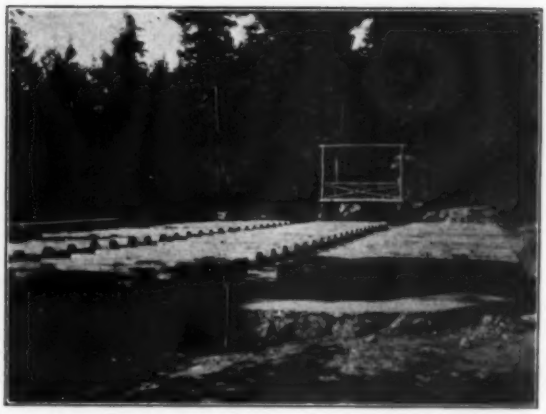
As an illustration, test yourself with the American flag. Surely you have gazed at the Stars and Stripes often enough to describe the flag. Don't look, and answer these questions: What comes first, a red or a white stripe? Are there more red stripes than white stripes? How many stripes are opposite the blue field?

A by-product of nature study is the necessity of unconsciously analyzing what is seen. Take a tree. A tree is big and strong and beautiful. You look at it. What do you see? Why — just a tree. What does a forester see? He instantly recognizes it by name, as you recognize a relative. He sees possible disease; board feet of lumber, cords of firewood, rolls of white paper. What does the observant nature lover see? He sees the texture of the bark; the shape of the leaves; whether there is one leaf or several on

a leaf stem; whether the twigs toward the ends of the branches are opposite one another or alternate; the nature of the blossom or fruit. He sees all this at a glance and classifies the tree by name. A tree is a comparatively simple thing. It is too big to be overlooked. But under that tree, in the forest and on the edge of clearings, in swamps, is a marvelous and little-noticed world ready for exploration by the inquisitive, with the naked eye and with the magnifying glass and the microscope.

Nature study in camp under a popular leader opens a field of activity for city campers that vies with sports, with boating, with swimming. It gives point and interest to hikes. It improves the cultural outlook.

But there is a danger. The average person, in nature's wonderland, is too prone to pick. The thing to emphasize in popular nature study trips is: Do not pick, be reverent, look, listen, smell, analyze, make notes, photograph, sketch. One hundred persons collecting specimens in a given area will disturb the balance very much; five thousand collectors would denude it.



Outdoor Assembly Area, Public Camp Site, Where Nature Talks Are Heard

Consequently, Rule No. 8, on public camp sites in the Forest Preserve, reads as follows: "Peeling bark or cutting or injuring trees is prohibited. Nor shall anyone on any public camp site in the Forest Preserve, or on Forest Preserve land adjacent thereto, cut, pluck, remove, destroy or otherwise injure or disturb any tree, shrub, bush, flower, plant, fern, moss, lichen or any part thereof."

Have an observant eye this summer.

Conservation of Ferns

EDITH A. ROBERTS, DEPARTMENT OF BOTANY, VASSAR COLLEGE

New York State is fortunate in having a wealth of beautiful ferns. Many different genera can be found; the cinnamon fern growing in open fields with its red-brown "fiddleheads" in the spring; the maidenhair growing in cool shade under hemlocks; the tall ostrich fern near streamsides and in elm woods, and many others. All of these ferns can be used in gardens, in window boxes and for table decorations, but wholesale stripping of the woods in order to obtain them will result in a repetition of the story of the arbutus or the fringed gentian, once so plentiful and now rare. There is a simple and easy way to grow these ferns in your own home or school. By

A Young Fern Transplanted to a Pot of Peat and Garden Soil

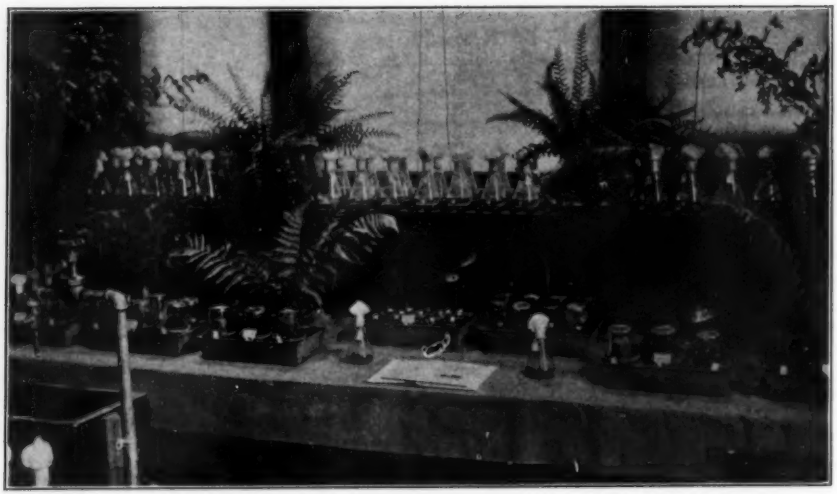


Exhibit of Methods of Propagating Native Ferns

employing this method there is no depletion of the plants in their native habitats, and you have the added pleasure of watching their growth before your eyes.

The necessary supplies are the dried fertile fronds, small clay pots and saucers, tumblers, sphagnum moss and a knife whose blade may be heated. The method consists of three parts: first collecting and drying the fertile fronds; second, germinating the spores on the outside of inverted, moist clay pots; third, transplanting the young fern plants to pots filled with peat and garden soil, and their subsequent development into healthy, normal fern plants.

The fronds which bear the spores may easily be recognized, as the under surface of the frond is covered with small, brown dots. These dots are composed of sporangia in which are borne the spores. Cut off the frond from the parent plant when the dots are brown, fold in smooth paper and allow to dry for one or two weeks. At this time a light tap will cause thousands of spores to fall from the frond to the paper. When the spores are thus ready, fill the pots with sphagnum moss. Place in a pan of water and allow to soak for several hours. Then remove from the pan and shake off the excess water. Heat the knife blade in a gas flame or alcohol lamp. (This will destroy spores of fungi and bacteria.) Scrape up enough spores from the paper to cover the tip of the knife, and sprinkle evenly over the top and sides of the inverted moist pot. Then place the pot in an inverted position on the saucer and cover with a glass tumbler. Keep in a warm place and fill the saucer with water daily. Within eight weeks the surface of the pot will be covered with small, green plants,

Sowing Fern Spores on Moist Clay Pot

and at the end of four months they will be large enough to be transplanted to pots filled with peat and garden soil. Their subsequent growth will depend on an adequate supply of moisture, moderate light and a moderately warm temperature.

One fertile frond of cliff brake, for example, collected in July will thus yield more than 100 fern plants within a year. This is constructive conservation which not only conserves, but actually increases our supply of native plant materials.

A Crop of Young Cliff Brake Ferns

Renovating the Woodland on New York Hills

JAMES R. SIMMONS, CHIEF FORESTER, LD–NY–4

The woodland of New York hills requires no particular introduction. We know that the hills themselves are among the most beautiful in the world. We know that many of them are wooded. But to renovate the woodland on those hills implies an undertaking in the field of conservation. According to strict definition, when we renovate we undertake to restore to a former or better condition of freshness. In plain terms, we set out to make as good as new.

Our subject, therefore, carries certain meanings that are not at first glance apparent in the title. The title might fit the requirements of a salesman of farm machinery equally as well as a forester. But what the reader wants to know as quickly as possible is hidden in the very first word. What do we mean by renovating, and by what agency will we renovate?

The Project LD–NY–4, which means Land Development-New York-Project 4, is one of several federal projects having to do with the right use of land. In Region 1 these projects are located from Maine to Maryland. Project 4 differs from most in that it contains six sites, or blocks, of approximately 5000 acres each, all within a radius of 20 miles of the city of Ithaca, N. Y. It is primarily a forestry project and therefore employs, among other officials, a supervising forester, with one assistant or site forester for each block.

Necessarily our present brief discussion must be limited to the silvicultural activities which enter into renovating the woodland of New York hills. But you will understand that, before any actual renovation can take place, there must be a project administrator or manager, who in turn is responsible to the regional director; there must be a preliminary survey; after that must come the optioning of land, the lease of land, and finally the purchase of land by the Government. Boundary surveys must be made by engineers. Titles must be searched. Renovation begins after the labor has been employed and provided with tools and equipment, and when the proper supervision has been organized.

Beginning at the point where a tract of land lying within the site has been leased or purchased by the project, the foresters go in in advance of the labor and mark the trees that are to be removed in the renovating process. On this project the technical work has been going on since January 1936. Every tree selected for removal bears the mark of the forester. And every woods worker, from site superintendent down through foreman and woods boss to the last recruited laborer is instructed to remove only those trees that have been marked by the forester.

Most of this work is known as timber stand improvement. You will note the similarity between that title and renovating the woodlands. But there are also fire hazard reduction, insect and disease control, stream improvement, ero-

Where Forestry, Stream Improvement and Landscape Work Meet

sion control, biological work in relation to wild life, road construction, and other forms of renovation. And there will be reforestation of old fields and pastures in due course.

What are the general principles involved in marking a stand of timber for improvement? Dead trees are removed as a matter of course if they interfere in any way with good live specimens or if they constitute a fire risk. Some of them will yield a usable form of forest products, chiefly posts and poles. Weed trees, those of inferior species or quality that are a detriment to the stand, are also taken. Suppressed trees, slowly declining specimens that have been left far behind in the struggle for existence, will be removed. There will be some mature trees, those that have reached the limit of usefulness and productive ability and are ready to harvest. There will be wolf trees, occupying more ground than belongs to them, and shading out valuable reproduction underneath. For the rest it is a matter of judgment in selection, a decision as between species and specimens within the species, as to what is best for the forest of the future. In all this work due consideration must be given to the welfare of wild life by sparing a sufficient portion of the better food trees and plants, and good landscape technic must also be applied.

A Colony of Beavers Does Some Selective Cutting

There are of course contingencies over which the forester has no control. For example, the ice storm of March 1936, inflicted great damage on some of the finest stands of timber worked during that winter. Many of the laborers employed in the woods have not had previous experience in this type of work. There are problems of transportation and supervision.

Hills of New York

A forested hill in left background; worn-out farm land to be reforested in right background; small stream to be improved and controlled in middle foreground; stump fence, from white pine cut more than 100 years ago, to be left as cover for wild life; group of foresters standing in the gap.

There may arise at any time in spring or fall problems connected with forest fire, more difficult of solution while they last than those of ice, snow or labor. Always present is the problem of coordination of forestry work with wild life and landscape work.

You undoubtedly recall the story of the sea captain and his daughter whom the Leatherstocking in Cooper's tale guided down the tributary waters of Ontario, through the unbroken forest to the great inland sea. And how the young woman compared that sea of leaves to the great ocean. She called attention to a forest untouched by the hand of man. We are working in the remnants of that forest.

Unfortunately our efforts will never result in restoring the original forest to New York State. In the nature of things, and in view of the distance we have come since the Leatherstocking and the Indians wandered these hills, we can not make the woodlands as good as new. We would not only have to renovate the woodland on the hills but reforest the valleys as well. And in the valleys stand our cities and towns.

Reforestation of old fields and previously lumbered areas will be a part of our work, beginning in the spring of this year and increasing, we trust, thereafter, until approximately 30,000 acres of land in this area of New York State will be composed in large part of forested land, capable of many good uses.

When I reflect upon the damage we have suffered from flood alone here among the headwaters of one of our larger drainage areas I consider that restoration of the woodland to a former or better freshness, so far as we are now able, is a fundamental procedure in land utilization.

Junior Audubon Clubs Promote Study of Wild Life

Through the Junior Audubon Bird Clubs the National Association of Audubon Societies aims to promote the protection and preservation of wild life. Last year more than 155,000 children were enrolled in 5500 junior bird clubs in this country and Canada.

Each teacher organizing a club of 25 or more members receives a year's free subscription to Bird-Lore, containing illustrations and articles helpful to teachers and leaders in carrying out their nature study programs.

Information as to how to form a junior bird club will be sent on request by the educational department of the National Association of Audubon Societies, 1775 Broadway, New York City.

A Collection of Seeds of American Plants

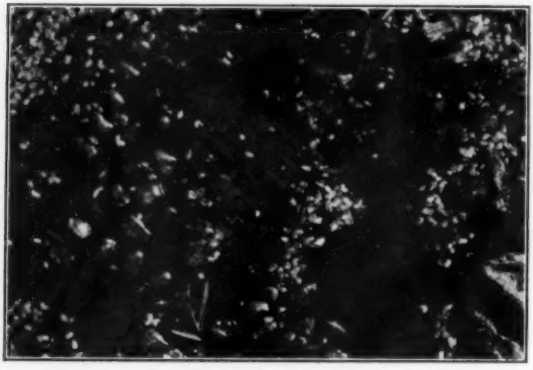
EDITH A. ROBERTS, DEPARTMENT OF BOTANY, VASSAR COLLEGE

Many schools have a collection of specimens of native plants, but how many have a collection of the *seeds* of native plants? Why not start such a collection? By carefully watching the flowers as they are blooming and gathering the seeds of only one flower of each kind of plant an interesting collection can be made. The rest of the flowers and seeds must be left upon the plant in order that they fall to the ground and reproduce more plants.

Such a collection should contain as many kinds of seeds from the native plants, trees, shrubs and herbs as you can find. For each plant have only as many seeds as are produced by *one* flower. When collecting make a record of the kind of place, upland or lowland; also note other kinds of plants growing in association with the plant of which you are collecting the seed. After the seeds are dry put them in a small glass jar and label with the name of the plant, the kind of place in which found and the name of one plant found associated with it. If a report of the collections made in the schools could be sent to the Vassar College Department of Botany, we would be glad to compile such a list and send a copy to each of the schools sending in their list.

Plant of Arrow Arum

The mature flower stalk bends and the fruit ripens under water.



Seeds of Arrow Arum

The seeds fall from the fruit upon leaves under the water.

A249m-Mr37-14,000(15192)*

UNIVERSITY OF THE STATE OF NEW YORK PRESS